CLAIMS

What is claimed is:

1. A braking apparatus, comprising:

a first rotating member having at least one rigid stop thereon;

a plurality of flexible stops which are selectively movable toward said first rotating member to engage said at least one rigid stop; and

an actuator which is slidable to selectively engage said plurality of flexible stops and cause said flexible stops to move toward said first rotating member to engage the rigid stop on said first rotating member.

2. The braking apparatus according to claim 1, wherein said actuator is arranged such that sliding movement thereof changes the number of said flexible stops engaging said rigid stop to provide incremental braking.

3. The braking apparatus according to claim 1, wherein said actuator is slidable along a circumferential path spaced from said first rotating member.

4. The braking apparatus according to claim 1, wherein said flexible stops are arranged in a plurality of rows with each row comprising a plurality of the flexible stops, and said actuator is slidable to selectively engage said flexible stops to move all of the flexible stops in each row simultaneously toward said first rotating member.

5. The braking apparatus according to claim 4, wherein said first rotating member has a plurality of rigid stops thereon, and said rigid stops are spaced

circumferentially around said first rotating member and disposed in a generally axial direction on an outer cylindrical surface of said first rotating member.

6. The braking apparatus according to claim 5, wherein said rows of flexible stops are arranged generally parallel to said rigid stops.

7. The braking apparatus according to claim 1, wherein a ratio of a length of said flexible stops to a height of said rigid stops is about 12 to 1.

8. The braking apparatus according to claim 1, wherein said actuator comprises a sliding member having at least one beveled surface for engaging the flexible stops and moving the flexible stops toward the first rotating member.

9. The braking apparatus according to claim 1, wherein said actuator comprises a sliding member for engaging the flexible stops, and an interface between said sliding member and said flexible stops comprises a beveled surface for moving the flexible stops toward the first rotating member.

10. The braking apparatus according to claim 1, wherein said flexible stops have longitudinal axes and are movable along their respective longitudinal axes toward and away from said first rotating member.

11. The braking apparatus according to claim 10, wherein said sliding member is arranged to slide along a circumferential path that intersects said longitudinal axes of said flexible stops.

12. A braking apparatus, comprising:

a first rotating member having a plurality of rigid stops thereon, said rigid stops being spaced circumferentially around an outer cylindrical surface of said first rotating member;

a plurality of flexible stops arranged in a plurality of rows, said flexible stops being selectively movable toward said first rotating member from a disengaged position into an engaged position in which the flexible stops engage said rigid stops as the first rotating member rotates; and

an actuator which is operable to move a selected number of rows of said flexible stops into their engaged positions to provide incremental braking of said first rotating member.

13. The braking apparatus according to claim 12, wherein said rows of flexible stops are staggered so that the flexible stops of adjacent rows are offset from one another in both circumferential and axial directions of said first rotating member.

14. The braking apparatus according to claim 12, wherein said rows of flexible stops each comprises a plurality of flexible stops arranged along a line which is parallel to an axis of rotation of the first rotating member.

15. The braking apparatus according to claim 12, wherein said rows of flexible stops are arranged in a matrix and held in position by a grid such that the flexible stops of adjacent rows are not in circumferential alignment with each other.

16. The braking apparatus according to claim 12, wherein said rigid stops each comprises a blunt leading face projecting radially outwardly from an outer surface of said first rotating member for engaging said flexible stops.

17. The braking apparatus according to claim 16, wherein said rigid stops each further comprises a tapered trailing face that tapers from an outer point of the blunt leading face to the outer surface of the first rotating member.

18. The braking apparatus according to claim 12, wherein said flexible stops each comprises a blunt leading face for engaging said rigid stops and a tapered trailing face.

19. A method of braking, comprising the steps of:

providing a first rotating member having rigid stops spaced circumferentially therearound, and a plurality of rows of flexible stops which are movable toward said first rotating member to engage said rigid stops; and

moving a selected number of rows of said flexible stops toward said first rotating member to engage the rigid stops and provide incremental braking of the first rotating member.

20. The method of braking according to claim 19, wherein said step of moving said flexible stops comprises sliding an actuator into engagement with said flexible stops to move said flexible stops toward said first rotating member one entire row at a time.

21. The method of braking according to claim 20, wherein said rows of flexible stops are each arranged along a line extending generally parallel to an axis of rotation of the first rotating member, and wherein said rows of flexible stops are staggered such that the flexible stops of adjacent rows are not in circumferential alignment with each other.